Unit 1 The set of Natural numbers

The set of:

Natural numbers	N = {0, 1, 2, 3, 4, 5, 6, 7, 8, ……………… }
Counting numbers	C = { 1, 2, 3, 4, 5, 6, 7, 8,………………...... }
Even numbers	E = {0, 2, 4, 6, 8, 10, 12, 14, ……………. }
Odd numbers	O = {1, 3, 5, 7, 9, 11,13, 15,…………….. }
Prim numbers	P= {2, 3, 5, 7, 11, 13, 17, 19, ……………. }

1) Complete using ∈, ∉, ⊂ or ⊄:

a) 0…… N

b) 1.2 …… N

c) $\frac{8}{4}$…… N

d) Ø …… N

e) {1, 1.5, 2, 3 } …… N

f) {2, 5, 7 } …… N

g) $\frac{3}{5}$…… N

h) 100 …… N

2) Complete:

a) The smallest natural number is …………

b) The smallest counting number is …………

c) The set of natural numbers which are less than 6 is

…………………………………………..

d) The set of Natural numbers which are less than or equal 8 is

…………………………………………..

e) The set of natural numbers between 3 and 7 is

…………………………………………..

3) Represent the following set on the number line:

a) {3, 4, 5, 6}

b) The set of natural numbers greater than 5

c) {0, 2, 4,…………}

d) {3, 5, 7,…………}

4)Write the following sets using the listing method then represent them on the number line:

a) X={ a : a ∈ N , a ≤ 6}

……………………………………………………………………………………

b) Y={ x : x ∈ N , x > 5}

……………………………………………………………………………………

c) Z={ x : x ∈ N , 1 ≤ x ≤ 5}

……………………………………………………………………………………

d) A={ a : a ∈ N , 2 <x <8}

……………………………………………………………………………………

e) B={ a : a ∈ N , 6 ≥ a > 2}

……………………………………………………………………………………

f) C = { a : a ∈ N , a ≥ 4}

……………………………………………………………………………………

g) F = { x : x ∈ N , x≤ 4}

……………………………………………………………………………………

5) If a , b and c are natural numbers where $a>b$, $a>c$ and $b<c$

Represent these numbers on the number line.

………

6) If k, L, M and N are four natural numbers where $M>N$, $k<M$ and $N<K$ and $L<N$. Represent these numbers on the number line.

………

7) If the greatest number of three consecutive natural numbers is $x+6$

Find the other two numbers ……………………………………………………………

8) If the greatest number of five consecutive even natural numbers is $x+10$

Find the other four numbers ……………………………………………………………

9) If the middle number of 3 successive natural odd numbers is Z

Find the other two numbers ……………………………………………………………

10) ***Complete:***

a) $E \cup O =$ …….

b) $E \cap O =$ …….

c) $E \cap P =$ …….

d) $N \cap P =$ ……. , $N \cap O =$ ……. , $N \cap E =$ …….

e) $N \cup P =$ ……. , $N \cup O =$ ……. , $N \cup E =$ …….

f) $N - E =$ ……. , $N - O =$ …….

$O - E =$ ……. , $E - O =$ …….

g) The smallest prime odd number is …………

h) The smallest odd number is …………

Operations on Natural numbers

Addition in N:

1) Complete:

a) The additive neutral element is ……………

b) 15 + (23 + …….) = (15 + …….) + 17 (………………….. Property)

c) 99+ ……. = 99 (………………….. element)

d) 73 +……. = 27 + ……. (………………….. Property)

e) 120 + 80 = ……. ∈ N (………………….. Property)

---

2) Use the properties of addition in N to find the result of each of the following:

a) 536 + 280 + 464

……………………………..

……………………………..

……………………………..

b) 388 + 749 +612 + 251

……………………………..

……………………………..

……………………………..

Subtraction in N:

1) Make a line graph for the following:

a) 6 – 4

b) 9 – 5 – 1

2) Complete using ∈ or ∉:

a) 8 – 4 ……… N

b) 0 – 1 ……… N

c) 3 – 5 ……… N

d) 10 – 7 ……… N

Multiplication in N:

1) Complete:

a) The multiplicative neutral element is ………

b) 3 × (………× 9) = (………× 9) ×……… (…………………… Property)

c) ……. ×15 = 15 (…………………… element)

d) 24×……. = 32× ……. (…………………… Property)

e) 50 ×10 =……. ∈ N (…………………… Property)

f) $4\times 28 \times 25 = 28 \times \ldots\ldots \times 25$ (………………… Property)

$= 28 \times (25 \times \ldots\ldots)$ (………………… Property)

$= 28 \times \ldots\ldots = \ldots\ldots$

g) $6 \times 102 = 6 \times (\ldots\ldots + \ldots\ldots)$

$= 6 \times \ldots\ldots + 6 \times \ldots\ldots$ (………………… Property)

$= \ldots\ldots + \ldots\ldots = \ldots\ldots$

---

2) Use the properties of multiplication in N to find the result of each of the following:

a) $2\times 13 \times 5$ …………………………………… …………………………………… …………………………………… b) $8\times 19 \times 125$ …………………………………… …………………………………… ……………………………………	c) $4\times 6 \times 25 \times 9$ …………………………………… …………………………………… …………………………………… d) $20\times 7 \times 50 \times 3$ …………………………………… …………………………………… ……………………………………

3) Use the distributive property to find the result of each of the following:

a) 26×101

....

....

....

b) 35×1004

....

....

....

c) $(97+13) \times 56$

....

....

....

d) 48×9

....

....

....

e) 15×346

....

....

....

f) $8 \times (195+15)$

....

....

....

4) Use the properties of multiplication in N to find the result:

a) $32 \times 64 + 32 \times 36$

b) $15 \times 45 + 15 \times 55$

c) $47 \times 7 - 37 \times 7$

d) $16 \times 999 + 16$

e) $37 \times 40 + 37 \times 61 - 37$

Division in N:

1)Find the result:

a) $\frac{4+8}{60 \div 5}$

b) $\frac{30 \div 15}{9-9}$

---

2) Complete using ∈ or ∉:

a) $48 \div 6$ .... N

b) $9 \div 2$ .... N

c) $\frac{3-3}{7+8}$......... N

d) $5 \div 0$ .... N

Numerical pattern:

1) Complete in the same pattern:

a) 5, 55, 555, ……… , ………

b) 1, 3, 5, ……… , ………

c) 2, 3, 5, 8, ……… , ………

d) 4, 9, 14, 19, ……… , ………

e) 2, 4, 8, ……… , ………

f) 1, 5, 25, ……… , ………

g) 100, 90, 81, 73, ……… , ………

h) 1, 4, 9, 16, ……… , ………

i) 1, 1, 2, 3,5, 8, ……… , ………

---

2) What is the tenth term of the sequence?

a) 1, 3, 6, 10, 15, ……………………………………………………………………………

b) 1, 4, 9, 16 , ……………………………………………………………………………

Unit 2 Equations

1) Translate into symbolic expression:

a) Twice the number x ………………

b) Add 7 to the number y ………………

c) Subtract 5 from the number z ………………

d) Multiply 4 by the number k ………………

e) Divide the number L by 3 ………………

f) Add 6 to the 3 times of a number ………………

g) Subtract 1 from the half of a number ………………

h) Four more than a number X ………………

i) Eight less than a number X ………………

j) A number M is subtracted from 15 ………………

k) Multiply a number F by 6 then subtract 4 from the result………………

l) Divide a number L by 4 then add 7 to the Quotient ………………

m) Twice of a number subtracted 8 from it ………………

2) Complete:

a) Ahmed is x years old then his age after 3 years is ……………..

b) A square of side length y then its perimeter is ……………..

c) Nada bought 3 pens for L.E x each and 5 note books for L.E y each.

Then she paid ………………………..

d) The perimeter of a rectangle is 30 cm if its length is x cm, then its width is

………………………..

e) The sum of two numbers is 9 if one of them is m then the other number is ………………………..

f) The difference between 2 numbers is 9 if the smaller number is x then the greater number is ………………..

g) The difference between 2 numbers is 8 if the greater number is y then the smaller number is ………………..

---

3) Write the mathematical relation:

1) If the price of one book = L.E 5,

The number of books is x The total price of booksis y

The mathematical relation is …………………………………………

2) If the base of an isosceles triangle = 7 cm , AB=AC=L cm

Then the perimeter is P=………………..

3) If the price of one meal is 20 pounds

The delivery service = 5 pounds for any number of meals

The number of meals is x Total price is Y

The mathematical relation is …………………………………………

4) If the side length of an equilateral triangle is L Then the perimeter is P=………………..

4) Solve the following equations:

a) $x + 5 = 13$

……………………………

……………………………

……………………………

b) $y - 7 = 20$

……………………………

……………………………

……………………………

c) $10 - x = 4$

……………………………

……………………………

……………………………

d) $2x + 5 = 35$

……………………………

……………………………

……………………………

e) $3x = 27$

……………………………

……………………………

……………………………

f) $7x - 7 = 21$

……………………………

……………………………

……………………………

g) $\frac{1}{4}y = 3$

……………………………

……………………………

……………………………

h) $\frac{1}{3}y + 6 = 7$

……………………………

……………………………

……………………………

5) *Translate each verbal statement into an equation:*

a) A number if added to 6 the sum is 10

…………………………………………………………..

b) If 3 is subtracted from a number produces 25

…………………………………………………………..

c) If 7 is subtracted from twice of a number then the result is 15

…………………………………………………………..

6) *Solve the following equations:*

a) $37 + x = 11 + 37$ ……………………………………

b) $6 \times 79 = (y \times 9) + (y \times 70)$ ……………………………………

c) $26\,x = 7 \times 26$ ……………………………………

d) $783 = x + (8 \times 10) + (7 \times 100)$ ……………………………………

e) $(y+5) \times 8 = 8 \times 9$ ……………………………………

f) $x \times 5 + x \times 60 = 65 \times 4$ ……………………………………

7) If $y = 3x$ is a mathematical relation between x and y, then complete the table:

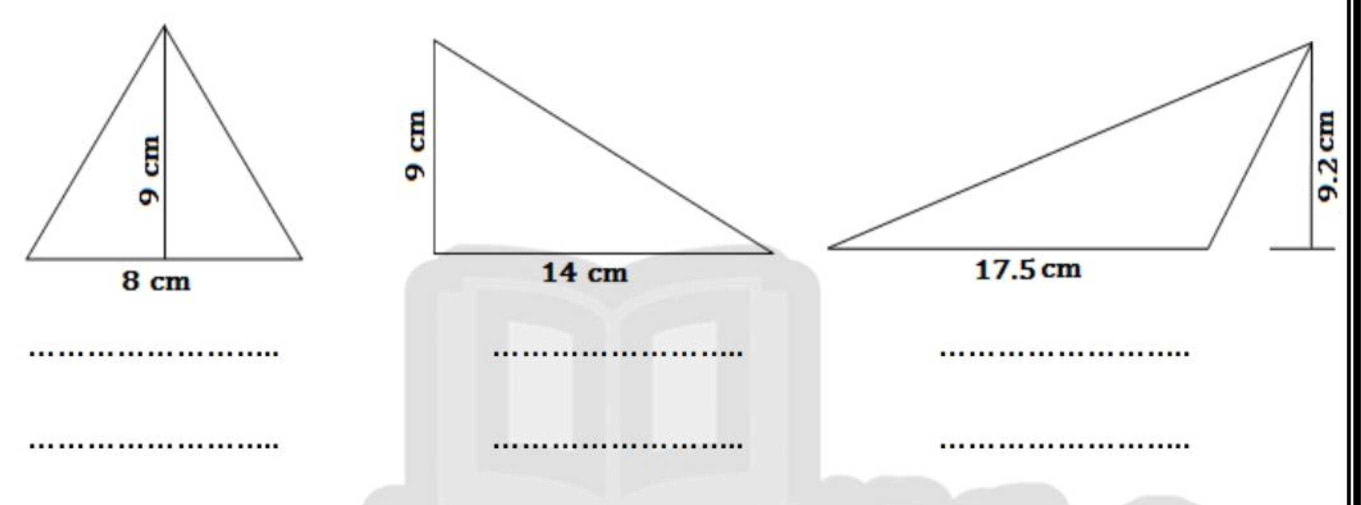
x	3	0	…..	7	5
y	…..	…..	27	…..	…..

8) If $y = 5x-2$ is a mathematical relation between x and y, then complete the table:

x	1	2	…..	4	5
y	…..	…..	13	…..	…..

Unit 3: Measurement

1) *Find the area of the following triangles:*



…………………….. …………………….. ……………………..

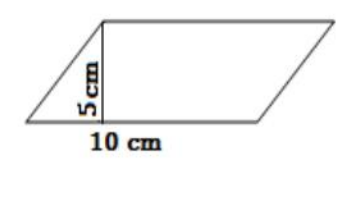
…………………….. …………………….. ……………………..

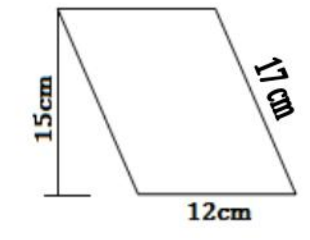
2) Calculate the area of an equilateral triangle if its perimeter is 21 cm and its height is 4 cm

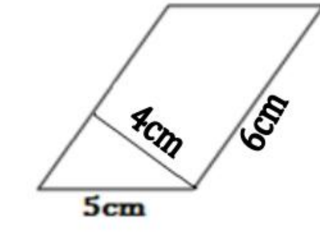
……………………………………………………………………………………………

……………………………………………………………………………………………

3) Find the area *the following* parallelograms:







…………………….. …………………….. ……………………..

…………………….. …………………….. ……………………..

4) Which is greater in area a parallelogram of base 4 cm and height 5 cm or a triangle of base 8 cm and height 3cm?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

5) Find the area *the following* squares:

8cm

12cm

……………………… ………………………

……………………… ………………………

6) Find the area of the coloured surface:

2cm

4.5cm

6cm

……………………………………………………………

……………………………………………………………

……………………………………………………………

……………………………………………………………

7) A square of diagonal 18 cm. Find its area.

……………………………………………………………………………………………………

8) A square of area 32 cm². Find the length of its diagonal.

……………………………………………………………………………………………………

9) A square of side length 6 cm, its area is equal to the area of a rhombus if the length of one of its diagonals is 9 cm. Find the length of the other diagonal.

……………………………………………………………………………………………………

……………………………………………………………………………………………………

10) <u>Find the area of each rhombus:</u>

4cm
3cm

8cm
16cm

4cm
14cm

…………………….. …………………….. ……………………..

…………………….. …………………….. ……………………..

11) Find the area of a rhombus of diagonals 8 cm and 6 cm

……………………………………………………………………………………………

12) Find the area of a rhombus of side length12 cm and height 3 cm

……………………………………………………………………………………………

13) If the side length of a rhombus is 6 cm, its height is 4 cm and the length of one of its diagonals is 12m. Find the length of the other diagonal

……………………………………………………………………………………………

……………………………………………………………………………………………

14) Which is greater in area a parallelogram of base length 7cm and height 5 cm or a rhombus of side length 8cm and height 4cm?

……………………………………………………………………………………………

……………………………………………………………………………………………

15) Find the circumference of the following circles ($\pi = \frac{22}{7}$):

a) r=14cm ……………………………………………………………………

b) d= 21 cm ……………………………………………………………………

---

16) Find the circumference of the following circles to the nearest tenth ($\pi = 3.14$):

a) r = 4.9 cm ……………………………………………………………………

b) d= 5.6 cm ……………………………………………………………………

---

17) A circle of circumference 22cm find its diameter ($\pi = \frac{22}{7}$)

……………………………………………………………………………………………………

---

18) Find the difference between the circumferences of two circles the first of diameter 28 cm and the second of radius 7cm.

……………………………………………………………………………………………………

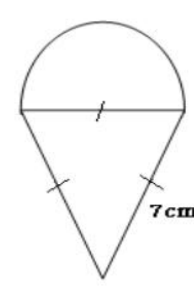
……………………………………………………………………………………………………

……………………………………………………………………………………………………

---

19) Calculate the perimeter of the opposite figure where ($\pi = \frac{22}{7}$)





Unit 4: Geometric transformation

1) In Cartesian co-ordinate plane from the following figure :

a) Complete:

A (……… , ………)

B (……… , ………)

C (……… , ………)

b) If L is the axis of reflection of the triangle ABC , Find the image of the triangleby reflection in L then complete:

The image of A by reflection in L is A`(……… , ………)

The image of B by reflection in L is B` (……… , ………)

The image of C by reflection in L is C` (……… , ………)

---

2) In Cartesian co-ordinate plane from the following figure :

a) Complete:

A (……… , ………)

B (……… , ………)

C (……… , ………)

D (……… , ………)

b) If L is the axis of reflection of the parallelogram ABCD , Find the image of the parallelogramby reflection in L then complete:

The image of A by reflection in L is A` (……… , ………)

The image of B by reflection in L is B` (……… , ………)

The image of C by reflection in L is C` (……… , ………)

The image of D by reflection in L is D` (……… , ………)

3) In Cartesian co-ordinate plane from the following figure :

a) Complete:

A (……… , ………)

B (……… , ………)

C (……… , ………)

b) If L is the axis of reflection of the triangle ABC , Find the image of the triangle by reflection in L then complete:

The image of A by reflection in L is A` (……… , ………)

The image of B by reflection in L is B` (……… , ………)

The image of C by reflection in L is C` (……… , ………)

---

4) In Cartesian co-ordinate plane from the following figure :

a) Complete:

A (……… , ………)

B (……… , ………)

C (……… , ………)

D (……… , ………)

b) If L is the axis of reflection of the figure ABCD , Find the image of the figure by reflection in L then complete:

The image of A by reflection in L is A` (……… , ………)

The image of B by reflection in L is B` (……… , ………)

The image of C by reflection in L is C` (……… , ………)

The image of D by reflection in L is D` (……… , ………)

Unit 5: Statistics

1) Complete the following frequency table:

Numbers	Tally	Frequency
1	……	……
2	……	……
3	……	……
4	……	……
5	……	……
Total	20	

4 5 4 5 3 3 2 4 1 3

4 3 1 3 2 4 3 5 2 2

2) The following table shows the marks of 29 pupils in mathematics:

Marks	5 -	10 -	15 -	20 -	25 -	Total
Number of pupils	///	~~////~~ //	~~////~~ ////	~~////~~ /	////	29

a) Rewrite the previous table showing frequency in numbers.

b) How many pupils get less than 15 marks?

c) Draw the frequency histogram and frequency polygon of this distribution.

3) ***The following table showsthe daily wages of 50workers in a company:***

Wages	20 -	30 -	40 -	50 -	Total
Number of workers	10	8	20	12	50

Draw the frequency histogram and frequency polygon of this distribution

4) ***The following table shows how a family spends its monthly income:***

Food	Transports	Electricity	Rent	treatment
800	600	300	400	300

Represent these data by pie chart

5) ***Represent these data by pie chart***

Grade	1st	2nd	3rd	4th
Students	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$

Test 1

1) Choose the correct answer:

a) The additive neutral element is ………… . (0 , 1 , 10)

b) The set of even numbers (E) ∩ the set of prime numbers (P) = …….(Ø , E , {2} , N)

c) A square of side length y then its perimeter is …… (4y , y+4 ,3y)

d) The triangle whose base length is 8 cm and the corresponding height of it is 5 cm then its area is……. (30 cm^2 , 20 cm^2 , 25 cm^2)

---

2) Complete:

a) The perimeter of a rectangle is 12 cm if its length is x cm, then its width is ………………

b) The area of the rhombus = $\frac{1}{2}$ × … … × … ….

c) Mary is x years now, then her age after 5 years will be ………………

d) 1 , 4 , 8 , 13 , …… , …… in the same pattern

e) The difference between two numbers is 4 if the smaller number is x then the greater number is ……………….

---

3) Write the following sets using the listing method then represent them on the number line:

a) X = { x : x ∈ N , 1< x ≤ 6}

b) Y = The set of even number greater than 3

4) a) Use the properties of addition to find: $26 + 167 + 24 + 333$

b) Use the distributive property to find: $(98 + 22) \times 5$

c) If the greatest number of three consecutive natural numbers is x+10

Find the other two numbers.

d) Solve the following equation: $y + 5 = 26$

5) a) In Cartesian co-ordinate plane determine the following points A(1,6) , B (1, 2) , C(5,2) , D(5,6) , If $\overleftrightarrow{CD}$ is the axis of reflection of the figure ABCD, then determine the image of the figure ABCD.

b) The following table shows the marks of 50 pupils in mathematics:

Marks	0 -	10 -	20 -	30 -	40 -	Total
Number of pupils	2	5	10	18	15	50

a) Draw the frequency histogram and frequency polygon of this distribution.

b) How many pupils get less than 30 marks?

c) How many pupils get 30 marks or more?



Test 2

1) Choose the correct answer:

a) The multiplicative neutral element is ………… . (0 , 1 , 10)

b) The set of even numbers (E) − the set of odd numbers (O) = …….(Ø , E , O , N)

c) $\frac{20 \div 2}{5 - 5}$ = ……. (10 , 0 , meaningless)

d) The sum of two numbers is 7 if one of them is y then the other number is …….
(7 + y , 7 - y , y - 7)

e) If x is an odd number then x+1 is ………. number (odd , even , prime)

2) Complete:

a) The number of axes of symmetry of the square equals …….

b) If a side length of a rhombus is L and its perimeter is P then the mathematical relation between P and L is P = …….

c) 1, 4, 9, 16, ……… , ……… in the same pattern

d) If 265 = x + (6 ×10) + (2×100) then x= …..

e) The circle whose diameter length is 7 cm, its circumference = ….. cm ($\pi = \frac{22}{7}$)

3)a) Use the properties of multiplication to find: $125 \times 27 \times 8$

b) Use the distributive property to find: 14×1001

c) Solve the following equations: 2x - 3 = 15

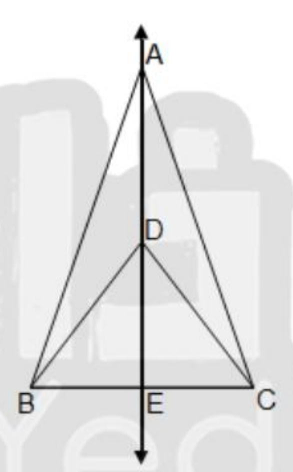
4) a) Which is greater in area a parallelogram of base length 6cm and height9 cm or a rhombus in which the length of its diagonals are 8 cm and 10cm

b) Write the following set using the listing method then represent it on the number line: $Z = \{ x : x \in N , 3 < x \leq 7\}$

c)If the base length of an isosceles triangle ABC is3cm, AB=AC=L cm
Then the perimeter is P=………………..

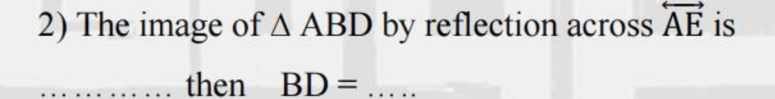
5) a) In the opposite figure, $\overleftrightarrow{AE}$ is the axis of reflection

Complete:




1) The image of Δ ABE by reflection across $\overleftrightarrow{AE}$ is

………… then AB = ….. and BE = …..


2) The image of Δ ABD by reflection across $\overleftrightarrow{AE}$ is
………… then BD = …..

3) Δ DEC is congruent to Δ …..

b) *The following table shows the working hours of 50 workers in a company:*

Number of hours	4 -	6 -	8 -	10 -	Total
Number of workers	12	10	18	10	50

Draw the frequency histogram and frequency polygon of this distribution